UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,428	03/02/2004	Ang-Sheng Lin	12539-US-PA	2427

31561 7590 05/18/2007

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER	
HUANG, DAVID S	
ART UNIT	PAPER NUMBER
2609	

NOTIFICATION DATE	DELIVERY MODE
05/18/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

UAS@JCIPGROUP.COM.TW

Office Action Summary	Application No.	Applicant(s)	
	10/708,428	LIN, ANG-SHENG	
	Examiner	Art Unit	
	David Huang	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Taiwan on December 26, 2003. It is noted, however, that applicant has not filed a certified copy of the 092136981 application as required by 35 U.S.C. 119(b).

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because:
> It does not state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56. Applicant's oath or declaration incorrectly references 37 CFR 1.56(a).

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 134a and 134b in Figure 1B. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not

accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. **Claim 3** is objected to because of the following informalities: the claim language is awkward and appears to be missing a word in the phrase, "...wherein the quadrature module further a base band transconductance..." For examination on the merits, the claim will be interpreted as if the phrase read: "...wherein the quadrature module further *comprises* a base band transconductance..." Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 1, 6-8, and 10** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **claim 1**, there are two recitations of the limitation "a base band transconductance," and it is unclear whether or not they refer to the same element. For examination on the merits the claim will be interpreted as if the limitations refer to different elements.

Claim 6 recites the limitations "the transmitter" in line 1, and "the offset compensation module" in lines 1-2. There is insufficient antecedent basis for these limitations in the claim.

For examination on the merits, the claim will be interpreted as being dependent on *claim 2* since sufficient antecedent basis is present in claim 2.

Claim 7 recites the limitation "the predetermined time interval" in line 6. As written, there is sufficient antecedent basis for this limitation in the claim (in *claim 1*); however, *claim 6* is interpreted as depending on claim 2, where there is insufficient antecedent basis for this limitation. For examination on the merits, the claim will be interpreted being dependent on *claim 6*.

Claim 8 recites the limitation "the DC offset minimum loop" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. For examination on the merits, the claim will be interpreted as being dependent on *claim 7* since sufficient antecedent basis is present in *claim 7*.

Claim 10 recites the limitation "the predetermined time interval" in lines 8-9. There is insufficient antecedent basis for this limitation in the claim. The claim will be interpreted as best understood.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kroebel et al. (US Patent Application Publication 2005/0190856).

Regarding **claim 10**, Kroebel et al. discloses a circuit method for detecting and compensating a current offset for a transmitter, comprising:

enabling the transmitter (this is taught implicitly, otherwise the transmitter would not function and none of steps would occur);

receiving voltage signals and converting the voltage signals into current signals (voltage/current converters 8, 9, pages 2-3, [0033], Figure 1);

intercepting a current offset of the current signals before the current signals are modulated and transmitted (page 3, [0035], see Figure 1); and

compensating the current offset (page 3, [0035], see Figure 1).

However, Kroebel et al. fail to expressly teach the compensating step takes place within a predetermined time interval.

Nevertheless, Kroebel et al. disclose trimming may be effected before a radio-frequency signal is transmitted. This teaching implies that there is a waiting period before transmission when the offset correction occurs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to compensate for the current offset within a predetermined time interval, as claimed, since Kroebel et al. suggests a time period before transmission, when trimming is effected.

8. **Claims 1-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (Background of Invention, pages 1-3 and Figure 1B) in view of Kroebel et al.

(US Patent Application Publication 2005/0190856) and the 35 U.S.C. 112 rejection applied above to claim 6.

Regarding **claim 1**, applicant admits as prior art a quadrature modulator (100, Figure 1B), comprising:

a base band transconductance, for converting a voltage signal into a current signal (130a and 130b, Figure 1B); and

a switching pair for modulating the current signal with local oscillator 116 (132a and 132b, Figure 1B).

However, the admitted prior art fails to disclose a current sink, coupled between the base band transconductance and a base band transconductance, for detecting a current offset of the current signal, wherein when the current sink is enabled to detect the current offset of a transmitter within a predetermined time interval, the switching pair is disabled, and after the predetermined time interval lapses, the current sink is disabled and the switching pair is enabled.

Kroebel et al. disclose an mobile radio transmitter with a feedback path which comprises an analog/digital converter 19, connected via a total of four switches 20 to respective associated balanced first signal inputs on the two mixers 10, 11 (page 3, [0035], Figure 1). Parallel output transistors 31 to 34 are used to tap off a portion of the baseband currents, and the voltage drop across a respective resistor is measured with an A/D converter. These transistors 31 to 34 form a unit with the output transistors in current mirrors 25-28 (page 3, [0042], Figure 2). Kroebel et al. also disclose the offset voltage trimming may be effected before a radio-frequency signal is transmitted (page 2, [0020]). This teaching implies that there is a waiting period before transmission when the feedback path is enabled and offset correction occurs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify applicant's admitted prior art with the feedback path taught by Kroebel et al. since it improves carrier suppression with little complexity (page 1, [0014]-[0015]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to compensate for the current offset within a predetermined time interval, as claimed, since Kroebel et al. suggests a time period before transmission, when trimming is effected.

Regarding **claim 2**, applicant admits as prior art a transmitter (with Gilbert-Cell quadrature modulator, page 2, [0006], Figure 1B), comprising:

a digital-to-analog converter module for receiving voltage signals (DAC 110a and 110b, Figure 1B);

a base band filter module, coupled to the analog converters module (112a and 112b, Figure 1B);

a quadrature module coupled to the base band filter module (100, Figure 1B), for converting filtered voltage signals into current signals and then modulating the current signals;

a radio frequency amplifier (118, Figure 1B), coupled to the quadrature module, for amplifying the modulated current signals and then transmitting amplified signals to an antenna.

However, the admitted prior art fails to disclose:

a current sink module, coupled to the quadrature module and enabled for intercepting the current signals to detect a current offset before the current signals are modulated; and

an offset compensation module, coupled between the current sink module and one of the digital-to-analog converter module, the base band filter module and the quadrature module, for compensating the current offset when the current sink module is enabled.

Kroebel et al. disclose supplementary transistors 31 to 34 which form the current-tapping connections of the modulator, which are connected to the feedback path in Figure 1 via switches 20 at A/D converter 19 (Page 3, [0041]; see Figure 2). Parallel output transistors 31 to 34 are used to tap off a portion of the baseband currents, and the voltage drop across a respective resistor is measured with the A/D converter (page 3, [0042], Figure 2). The A/D converter 19 outputs a digital signal to digital signal processor 3 in order to influence the inphase or quadrature path so as to correct the offsets (page 3, [0035], Figure 1), where processor 3 has two outputs with digital/analog converters 4 and 5.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide applicant's admitted prior art transmitter with the feedback path taught by Kroebel et al. since it improves carrier suppression with little complexity (page 1, [0014]-[0015]).

Regarding **claim 3**, in the combination applied to *claim 2* above, applicant's admitted prior art further discloses wherein the quadrature module further comprises a base band transconductance (130a, 130b, Figure 1B) and a switching pair (132a and 132b, Figure 1B), and Kroebel et al. disclose the current sink module is arranged between the base band transconductance and the switching pair (supplementary transistors 31 to 34 connected to the gate connections of output transistors in current mirrors 25 to 28, page 3, [0040]; see Figure 2).

However, the combination of applicant's admitted prior art and Kroebel et al. fails to expressly disclose when the current sink module is enabled, the switching pair is disabled.

Kroebel et al. disclose carrier trimming may be effected before a radio-frequency signal is transmitted (page 2, [0020]). This teaching implies that there is a waiting period before transmission when the feedback path is enabled and offset correction occurs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify applicant's admitted prior art with the feedback path taught by Kroebel et al. since the feedback path also improves sideband suppression with the tapped-off and digitized current data, in addition to carrier suppression (page 3, [0035]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to compensate for the current offset when the switching pair is disabled, as claimed, since Kroebel et al. suggests trimming is effected before transmission (page 2, [0020]).

Regarding **claim 4**, the combination applied to *claim 3* fails to explicitly disclose wherein when the current sink module is enabled within a predetermined time interval, and the switching pair is enabled after the predetermined time interval lapses.

Nevertheless, as discussed in the combination above (see *claim 3*), Kroebel et al. teaches carrier trimming may be effected before a radio-frequency signal is transmitted (page 2, [0020]). Therefore, the combination applied to claim 3 implicitly teaches when the feedback path is enabled, analog/digital converter 19 outputs a digital signal to digital signal processor 3 in order to influence the inphase or quadrature path so as to correct the offsets (page 3, [0035], Figure 1). Thus, after the time required to apply the offset correction (predetermined time interval) has

elapsed, the switching pair is enabled to modulate the corrected current signal with the local oscillator for transmission.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination applied to *claim 3* to specify enabling the feedback loop for a predetermined time interval since the offset correction takes time to propagate through the feedback loop and a predetermined time interval balances ensuring sufficient time for the correction to be applied with signal transmission rate.

Regarding **claim 5**, in the combination applied to *claim 2*, Kroebel et al. further disclose wherein offset compensation module (A/D converter 19, DSP 3, Figure 1) is coupled between the current sink module (transistors 31-34, Figure 2) and one of the digital-to-analog converter module (DAC 4 and 5, Figure 1), and applicant's admitted prior art discloses the base band filter module (112a and 112b, Figure 1B) and the base band transconductance (130a and 130b, Figure 1B).

Regarding **claim 6**, in the combination applied to *claim 2*, Kroebel et al. further disclose wherein the offset compensation module (digital signal processor 3) is a voltage offset compensator (page 2, [0017]).

Regarding **claim 7**, the combination of applicant's admitted prior art and Kroebel et al. disclose everything claimed as applied above (see *claim 2*), and further disclose, in Kroebel et al., wherein the voltage offset compensator further comprises a current-to voltage converter (resistor, page 3, [0042]) coupled to the current sink module (transistors 31 to 34), and a direct current (DC) offset minimum loop (DSP 3 and A/D converter 19) coupled to the current-to voltage converter (page 3, [0042]) for compensating a voltage offset (page 2, [0017], Figure 1).

However, the combination fails to explicitly disclose compensating a voltage offset within the predetermined time interval.

Kroebel et al. disclose carrier trimming may be effected before a radio-frequency signal is transmitted (page 2, [0020]). This teaching implies that there is a waiting period before transmission when the feedback path is enabled and offset correction occurs.

Therefore, it would also have been obvious to one of ordinary skill in the art at the time the invention was made to compensate for the offset within a predetermined time interval, as claimed, since Kroebel et al. suggests a time before transmission when trimming is effected.

Regarding **claim 8**, in the combination applied to claim 7 above, Kroebel et al. further discloses wherein the DC offset minimum loop (DSP 3, Figure 1) is further coupled to one of the digital-to-analog converter module (DAC 4 and 5, Figure 1), the base band filter module and the base band transconductance.

Regarding **claim 9**, applicant's admitted prior art discloses a transmitter having a quadrature modulator including a base band transconductance stage, a switching pair (132a, 132b, Figure 1B) but fail to expressly disclose neither a current sink arranged there between, nor the method comprising:

enabling the transmitter;

turning on the current sink and turning off the switching pair for a predetermined time interval;

compensating the current offset within the predetermined time interval; and

turning off the current sink and turning on the switching pair after the predetermined time interval lapses.

Nevertheless, it is implicit from the admitted prior art that the transmitter is enabled, otherwise the transmitter would not function and none of steps would occur.

Kroebel et al. disclose supplementary transistors 31 forming current-tapping connections which are connected to the feedback path in Figure 1 via switches 20 at A/D converter 19 (page 3, [0041]). The tapped signal is supplied to the digital signal processor 3 in order to influence the inphase or quadrature path so as to correct the offsets (page 3, [0035], see Figure 1). Kroebel et al. disclose carrier trimming may be effected before a radio-frequency signal is transmitted (page 2, [0020]). This teaching implies that there is a waiting period before transmission when the feedback path is enabled and offset correction occurs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify applicant's admitted prior art with the teaching of Kroebel et al. to use a feedback loop since it provides steps to improve carrier suppression with little complexity (page 1, [0014]-[0015]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify this combination to specify enabling the feedback loop for a predetermined time interval since the offset correction takes time to propagate through the feedback loop and a predetermined time interval balances signal transmission rate with ensuring sufficient time for the correction to be applied.

Citation of Pertinent Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kub et al. (US Patent 5,781,063) disclose an circuit using current to voltage converters in conjunction with Gilbert multiplier current outputs.

Vrancic et al. (US Patent 6,177,895) disclose a circuit for acquiring data using current-to-voltage (I/V) converter/preamplifier (PA), an ADC block and a digital signal processor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Huang whose telephone number is (571) 270-1798. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571) 272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lana Le
5-09-07

DSH/dsh

LANA LE
PRIMARY EXAMINER